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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/055,058	01/22/2002	Varadarajan Srinivasan	P191-CIP	9129

25670 7590 05/21/2004

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EXAMINER

CHACE, CHRISTIAN

ART UNIT	PAPER NUMBER
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2187

DATE MAILED: 05/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

*Filed response via
mail 11/22 - Monday.*

Office Action Summary

Application No.

10/055,058

Applicant(s)

SRINIVASAN ET AL.

Examiner

Christian P. Chace

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 8-11, 17-19, 22, 28, 29 and 34-36 is/are rejected.
- 7) ☒ Claim(s) 6, 7, 12-16, 20, 21, 23-27 and 30-33 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4.5.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Information Disclosure Statement

IDS submitted 10 May 2002 has been considered by examiner. IDS submitted 21 April 2003 has been considered by examiner. Initialed and signed copies of both are attached hereto.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1 and 2 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 29 and 30, respectively, of copending Application No. 09/829,355. Although the conflicting claims are not identical, they are not patentably distinct from each other because it would have been obvious to one of ordinary skill in the art to use a ternary CAM, as recited in the instant application, instead of a binary CAM, as recited in the copending application as a matter of design choice – a binary CAM is faster and cheaper, but ternary CAM has

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more options available to it. Specifically, the ability to have three states as opposed to the two states in the binary CAM.

Claim 1 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/000,122. Although the conflicting claims are not identical, they are not patentably distinct from each other because it would have been obvious to one of ordinary skill in the art to use a ternary CAM, as recited in the instant application, as a CAM, as recited in the copending application because a ternary CAM has many options available to it. Specifically, the ability to have three states as opposed to the two states in the binary CAM, for example. The priority index table of the copending application's claim 1 is the plurality of storage elements in the instant claim 1.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5, 8-11, 17-19, 22, 28-29, and 34-36 are rejected under 35 U.S.C.

102(e) as being anticipated by Srinivasan et al (US Patent #6,237,061).

Examiner also wishes to note that a 35 USC 102(e) rejection of many of the claims may be made with respect to other related applications cited in the PTO form 892 attached hereto. However, those applications also have the same assignee as the instant application, so in the interest of compact prosecution, examiner has not elaborated on each and every rejection, as they may be overcome as discussed below.

The applied reference has a common assignee and three common inventors with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

With respect to independent claim 1, a CAM system is disclosed in the title.

A ternary CAM array segmented into a plurality of array groups is disclosed in figure 6 as group #202. Each array group including a plurality of rows of ternary CAM cells (inherent in a ternary CAM that it has ternary CAM cells) is disclosed in figure 6 as one of the four rows in each group.

A plurality of first storage elements each for storing a priority of a corresponding array group is disclosed in figure 6 as the CAM index. As discussed in column 5, lines 34-55, the groups are prioritized by length of prefix by the index.

With respect to claim 2, two or more array groups having the same priority is disclosed in figure 6, as groups #202 and #204 both share the same index, or priority, as discussed supra.

With respect to claim 3, one of the rows of the ternary CAM cell comprising a plurality of CAM cells for storing a data word is inherent, but is shown in figure 6, where there are two four-bit words per row, and four rows per group, as discussed supra. A plurality of mask cells is disclosed in figure 6 as "MASK CELL."

With respect to claims 4 and 5, each data word comprising a "policy statement" is disclosed in the abstract as CIDR addresses being loaded into the CAM cells. CIDR is Classless Inter-Domain Routing, which is an addressing protocol, or policy. Therefore, CIDR addresses comprise a "policy statement," and is a protocol.

With respect to claim 8, each local mask word including a policy mask is disclosed in column 4, lines 30-34.

With respect to claim 9, a plurality of second storage elements each for storing a group valid bit indicating whether an associated array group is assigned its corresponding priority number is disclosed in figure 4, #108.

With respect to claim 10, a priority table including the plurality of first storage elements is disclosed in column 5, lines 34-55, which discusses the CAM itself serving as the priority table.

With respect to claim 11, an index circuit coupled to the ternary CAM array to determine the index of a location in the ternary CAM array that stores data that matches a search key is disclosed in figure 6, which shows the "index." Inherently, if there is an index, there is a circuit to determine the index, as a computer must always be told what to do.

With respect to claim 17, examiner notes that 35 USC 112, sixth paragraph is invoked in the instant claim, as the claim recites means-plus-function language. Accordingly, the means referred to must be the means disclosed in the specification. The instant specification discloses a longest prefix match as a means for string data in the array groups according to priority. Column 5, lines 34-55 disclose CIDR – longest prefix match storage.

With respect to claim 18, an address circuit coupled to the ternary CAM array to select a row of the ternary CAM cells for communicating data is disclosed in figure 4, #112.

With respect to claim 19, the address circuit comprising an address decoder to select a row in one array group corresponding to the priority in response to a next free address is disclosed in column 5, lines 22-24. A "next free address," is merely writing to the next address to be written to.

With respect to claim 22, each of the rows of ternary CAM cells including a valid bit storage element for storing a valid bit indicative of whether the corresponding row of ternary CAM cells stores valid data (which is what a valid bit is, and does, by definition), is disclosed in figure 4, #108.

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With respect to independent claim 28, a method of operating a content addressable memory (CAM) system including an array of ternary CAM cells segmented into a plurality of array groups is disclosed in the title and with respect to claim 1, *supra*.

Storing a plurality of priorities in a plurality of storage elements each associated with one or more of the array groups is disclosed in figure 6 as the "CAM index." The index being related to the priority is discussed *supra* with respect to claim 17.

Selectively storing data in the array groups according to priorities is also discussed *supra* with respect to claim 17.

With respect to claim 19, providing a next free address of an available row of ternary CAM cells within an array group corresponding to one of the priorities, and storing the data at the next free address is disclosed in column 5, lines 22-24. A "next free address," is merely writing to the next address to be written to. Examiner notes that this is merely writing to the CAM, or loading, as is disclosed in the abstract.

With respect to claim 34, selectively comparing a search key, or comparand, with data stored in the array groups is disclosed at the end of column 5 into column 6.

With respect to claim 35, comparing the search key with data stored in the array groups to generate match signals, comparing the associated priorities of each array group that includes data that matches the search key to generate a plurality of enable signals, and selectively qualifying the match signals in response to the enable signals to generate qualified match signals is disclosed in column 6, lines 5-15.

With respect to claim 36, generating an index of the highest priority match in response to the qualified match signals is disclosed in column 6, lines 11-13.

Allowable Subject Matter

Claims 6-7, 12-16, 20-21, 23-27, and 30-33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christian P. Chace whose telephone number is 703.306.5903. The examiner can normally be reached on 9-4-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald Sparks can be reached on 703.308.1756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Christian P. Chace